

eWant 24V DC cooker

– fit for purpose

An assessment of a 2.5 litre electric pressure cooker for possible use on solar home systems.



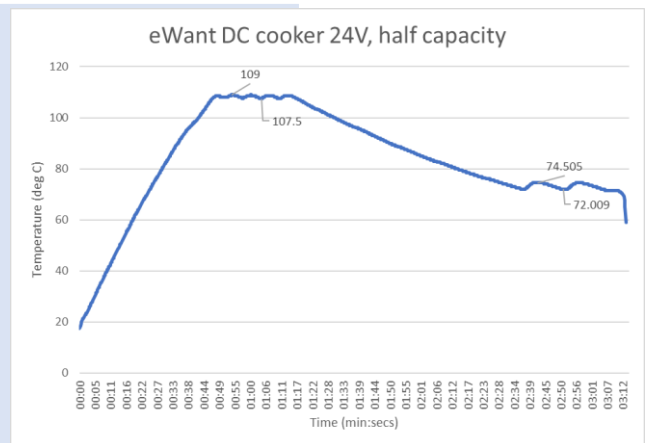
(Credit: Foshan Shunde Ewant Electrical technology Ltd)

While most commercially available electric pressure cookers work on Alternating Current (AC), there has been some discussion in the off-grid solar home system community of a need for a Direct Current EPC. The potential market for off-grid solar home systems that can deliver DC electrical cooking, centres on three ideas:- Efficiency (and simplicity) of the system, Lower power demand leading to lower discharge rates from batteries; Cost effectiveness resulting from the above features.

In 2020, a new Direct Current EPC was identified, made by the Foshan Shunde Ewant Electrical Technology Co Ltd who market their products under the name eWant.

The stated operating voltage is 24V, **the unit is a high quality design** that can operate at a wide range of voltages.

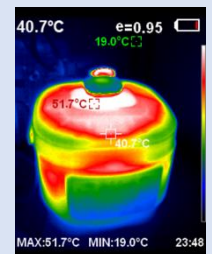
The unit behaves as one would expect, heating constantly until pressure is reached, **then self-switching off based on a pressure switch**, returning to heat occasionally to maintain pressure. It also has a **keep warm function**.



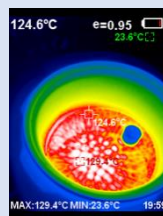
The lid has a locking pin preventing opening of the unit during the pressure phase. It also has safety weighted valve and thermal fuse.



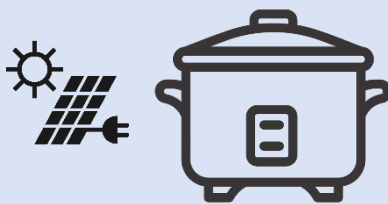
An air gap provides good insulation for cooking during the pressure phase. The handle on the lid remains cool enough to touch.



The unit can fry onions and cook with an open lid at 140 degrees C. It does not have a lid locked sensor and can cook without a lid on any setting.



Its efficiency and cost per capita meal is of the same order as AC EPCs (at an assumed tariff).



As a DC appliance it is a very welcome addition to the toolkit of off-grid appliances that can work on solar home systems where there is no grid connection. It can be considered an energy efficient appliance, that utilises pressure cooking to reduce cooking times for 'long cook' foods such as beans.

SPECIFICATIONS	
Capacity (L)	2.5 litres
Nominal Voltage & Frequency (V / Hz)	24 Volts Direct Current (24V DC)
Company	Foshan <u>Shunde Ewant Electrical technology Ltd</u>



TEST RESULTS		
Heating Phase*	Total Energy Consumption (Wh)	135
	Average Power Draw (W)	225
	Thermal Efficiency (from 30-90°C)	64%
	Temperature: Max (°C)	109
	Time to Reach Pressure Cooking Phase (min:sec)	36
Pressure Cooking	Total Energy Consumption (for 30 min; Wh)	19.8
	Average Power Draw (W)	39.5
	Temperature: Max / Min / Ave (°C)	109/107.5/108.5
	Pressure: Max / Min / Ave (kPa)	Not measured
Saute Cooking**	Calculated Total Energy Consumption (for 20 min; Wh)	46
	Average Power Draw (W)	138
	Temperature: Max / Min / Ave (°C) 1	141/128/136
	Temperature Stability (% time in ideal range)	Majority less than 140
Affordability***	Time to Reach Sauté Temperature (min:sec)	16 mins
	Unit Price (\$-\$\$\$\$)	\$\$
	Estimated Annual Operating Cost (at USD\$0.20/kWh)	\$14
	Estimate cost per capita assumed 0.3 litre per person to cook 365 meals (at USD\$0.2/kWh)	\$3.5

*While 36 minutes is twice as long as AC EPCs of the same size tested by the Global Leap it is important to **keep in view the time taken for the whole meal**. Both AC and DC cookers would have the same time 'preparing the food', (say 10 minutes to get it ready, chopping). Both do not require preparation time for the appliance (unlike lighting a biomass stove), so that while the DC EPC (at 225W) would take 36 minutes and the AC EPC (at 600W) would take 18 to 20 mins for the heating phase, both would take 30 minutes for the pressure phase. So in total, the time for the meal would be preparation, heating and pressure, with **76 minutes for the DC low power appliance and 60 minutes for the higher power AC EPC**.

**The low input power results in the temperature during sauté mode being lower than typical frying temperatures. As a result, recipes that require frying are likely to be difficult in this model of EPC, as frying will be significantly slower and it may not be able to obtain the characteristic browning of some foods.

***Affordability as defined in the Global Leap protocol barely works in this category of EPC. They designed the protocol to be a comparative measure for within a single class. We have added a cost per capita of cooking 0.3 litres of water.

(Summary : 24V DC Electric Pressure Cooker from Foshan Shunde Ewant Electrical technology Ltd

This material has been funded by UK Aid from the UK government; however the views expressed do not necessarily reflect the UK government's official policies. The report makes no claims and warranties about the safety, quality, energy performance, or appropriateness of any product. The product is provided and listed "as is" without warranty of any kind, whether express, implied, statutory, or otherwise. The authors bear no liability for any damages resulting from use (or attempted use) of the product. The inclusion in this working paper of a manufacturer's product should not be construed as an endorsement of that manufacturer or of its entire product line, nor of the product safety. We have made every effort to provide transparent and accurate testing results for the product performance metrics included. The performance data included here is the result of testing a sample product samples. Product performance may vary based on different product configuration, test environments or other factors. Products were tested in "as shipped" mode. Data used here should only serve as an indication of product performance. Bulk purchasers considering appliance products are strongly encouraged to request detailed test results from manufacturers and/or conduct independent testing